

IN THE CLAIMS:

1. (Previously presented) A dust collector comprising:

an upright tubular main body closed at top and bottom;

a tubular partition wall of a reduced diameter concentrically arranged internally of said main body to define a centrally located filtration chamber and an annular cyclone chamber situated outwardly of said filtration chamber, the lower edge of said partition wall terminating upwardly away from the bottom of said main body so that said filtration chamber and said cyclone chamber are in communication with each other at a lower part thereof;

a filter arranged in said filtration chamber and made of a filtration material for collecting submicron size particles;

means for applying vacuum to a secondary side of said filter;

an air inlet opening tangentially to an upper part of said cyclone chamber;

a drain opening located at the bottom of the main body;

spray means, provided at the upper part of said cyclone chamber, for forming a film of water flowing down along the inner circumferential surface of said main body and a film of water flowing down along the outer circumferential surface of said partition wall, respectively, to ensure that a swirling stream of air to be treated, drawn through said air inlet into said cyclone chamber, is brought into contact with said water films to thereby cause airborne dust and particles in the air to be treated to be captured therein and to cause captured dust and particles to be washed away, wherein said spray means directs substantially the entire amount of water supplied thereto onto the inner

circumferential surface of said main body and the outer circumferential surface of said partition wall whereby said substantially entire amount of water is consumed in the formation of the water films, wherein said spray means is an annular member with a plurality of nozzles which spray the water horizontally onto the inner circumferential surface of said main body and onto the outer circumferential surface of said partition wall, thereby wetting the inner circumferential surface and the outer circumferential surface 360 degrees around; and

wherein said air inlet is located below and spaced from said spray means.

2. (Previously presented) A dust collector according to claim 1, wherein said means for forming a film of water comprises an annular water supply means for spraying water toward the uppermost part of the inner circumferential surface of said main body and the outer circumferential surface of said partition wall.

3. (Previously presented) A dust collector according to claim 1 further comprising a plurality of flow straightening fins provided between the lower part of said partition wall and said main body to prevent air stream and water flowing down along the inner circumferential surface of said main body and the outer circumferential surface of said partition wall from swirling at the bottom of said cyclone chamber.

4. (Original) A dust collector according to claim 3, wherein said flow straightening fins extend radially and vertically.

5. (Previously presented) A dust collector according to claim 3, wherein each of said flow straightening fins further comprises a portion that extends along the bottom surface of said main body.

6. (Previously presented) A dust collector according to claim 1, further comprising one or more outwardly open supplemental drain openings provided at the lower part or bottom of said main body.

7. (Previously presented) A dust collector according to claim 2, further comprising a plurality of flow straightening fins provided between the lower part of said partition wall and said main body to prevent air stream and water flowing down along the inner circumferential surface of said main body and the outer circumferential surface of said partition wall from swirling at the bottom of said cyclone chamber.

8. (Previously presented) A dust collector according to claim 4, wherein each of said flow straightening fins further comprises a portion that extends along the bottom surface of said main body.

9. (Previously presented) A dust collector according to claim 2, further comprising one or more outwardly open supplemental drain openings provided at the lower part or bottom of said main body.

10. (Previously presented) A dust collector according to claim 3, further comprising one

or more outwardly open supplemental drain openings provided at the lower part or bottom of said main body.

11. (Previously presented) A dust collector according to claim 4, further comprising one or more outwardly open supplemental drain openings provided at the lower part or bottom of said main body.

12. (Previously presented) A dust collector according to claim 5, further comprising one or more outwardly open supplemental drain openings provided at the lower part or bottom of said main body.

13. (Previously presented) A dust collector according to claim 1 wherein said filter comprises a plurality of tubular filter elements extending in parallel within said filtration chamber.

14. (Previously presented) A dust collector according to claim 13 wherein said filter elements each comprise a pleated filter material.

15. (Previously presented) A dust collector according to claim 13 wherein said filter elements open into a top space within the top of said main body and further comprising a plurality of backwashing valves mounted within said top space and respectively arranged vertically above openings of the tubular filter elements.

16-20. (Canceled)